

In the Specification:

On page 1, after the title insert the following:

This is a U.S. national stage of application No. PCT/FR2005/000019, filed on 04 January 2005.

FIELD OF THE INVENTION

On page 1, before line 6, insert the following heading:

BACKGROUND OF THE INVENTION

On page 3, before line 33, insert the following heading:

SUMMARY OF THE INVENTION

On page 3, amend the paragraph beginning on line 33 through page 4, line 2 as follows:

One object of the invention is to ~~propose~~ provide an alternative solution to the problem of restoring a missing portion identified as that of a partial, in particular if the missing portion corresponds to a long period (greater than 10 ms), for which the prior art techniques are relatively ineffective.

On page 4, amend the paragraphs beginning on lines 3 and 14 as follows:

~~Accordingly, the technical problem to be solved by the present invention is that of proposing~~ This and other objects are attained in accordance with one aspect of the present invention directed to a method of restoring missing portions of partials of a sound signal during harmonic analysis in which the sound signal is divided into time frames to which time/frequency analysis is applied that supplies successive short-term spectra represented by sample frequency frames. ~~[[, the]]~~ The analysis further consisting in extracting extracts spectrum peaks in the frequency frames and ~~linking~~ links them together over time to form partials, ~~this method being an alternative to the prior art solutions. In accordance with the present invention, one solution to the stated technical problem consists in that said~~ The method of restoring a partial between a peak P_i and a peak P_{i+N} whose frequency ω and phase are known ~~is characterized in that it comprises the steps of:~~

estimating the frequency $\hat{\omega}$ of each of the missing peaks P_{i+1} to P_{i+N-1} of this partial;

calculating the phase $\hat{\phi}$ from peak to peak, from the phase of the peak P_i to that of the peak P_{i+N} , for all the frequencies $\hat{\omega}$ previously estimated;

calculating the phase error $err\phi$ between the calculated phase $\hat{\phi}$ and the known phase at the same peak P_{i+N} ; and

correcting each calculated phase $\hat{\phi}$ by a value that is a function of the phase error $err\phi$.

On page 4, amend the paragraph beginning on line 29 as follows:

A method in accordance with an embodiment of the invention differs from the prior art methods in that it offers finer control of the frequency of the missing peaks and subsequent calculation of the corresponding phases to ensure continuity with the phases of the existing peaks. Accordingly, a method in accordance with an embodiment of the invention re-synthesizes signals corresponding to the missing partial portions without artifacts, in contrast to the prior art methods described above.

On page 5, amend the paragraphs beginning on lines 1, 5, 7, 12 and 18 as follows:

A method in accordance with an embodiment of the invention also has the advantage of reconstructing a signal that is closer, in terms of the reconstruction error, to the original signal than is the signal obtained by the prior art methods.

~~Finally,~~ Further, a method in accordance with an embodiment of the invention has the advantage of using an algorithm of low complexity.

The invention ~~further consists in~~ can also include a synthesizer for synthesizing a sound signal for implementing a method of restoring a partial between a peak P_i and a peak P_{i+N} , for example an audio decoder or a parametric coder adapted to use a method of the invention.

The invention ~~further consists in~~ can also include a computer program product loadable directly into the internal memory of the above synthesizer or group of synthesizers and comprising software code portions for executing steps of a method according to the invention when the program is executed on the synthesizer or group of synthesizers.

The invention ~~further consists in~~ can also include a medium usable in the above synthesizer or group of synthesizers on which there is stored a computer program product loadable directly into the internal memory of the synthesizer or group of synthesizers and comprising software code portions for executing steps of a method according to the invention when the program is executed on the synthesizer or group of synthesizers.

On page 5, delete the paragraph beginning on line 26 through line 30 in its entirety.

On page 5, before line 31, insert the following heading:

BRIEF DESCRIPTION OF THE DRAWINGS

On page 5, before line 35, insert the following heading:

DETAILED DESCRIPTION OF THE DRAWINGS

On page 5, amend the paragraph beginning on line 35 through page 6, line 2 as follows:

A method 1 in accordance with an embodiment of the invention proceeds in the following manner, described here with reference to the Figure 1 flowchart. The method ~~consists in~~ includes restoring a partial between a peak P_i and a peak P_{i+N} whose frequencies ω and phases φ are known.

On page 7, amend the paragraph beginning on line 27 through page 8, line 11 as follows:

The Figure 2 example of use ~~consists in~~ includes restoring partials by means of the method 1 of the invention at the time of harmonic analysis of a sound signal, for example during parametric coding. The sound signal $s(n)$ is represented by a set of oscillators whose parameters (frequency, amplitude) vary slowly over time. In the conventional way, the harmonic analysis includes short-term time/frequency analysis 6 for determining the values of these parameters, followed by extraction of peaks 7, followed by tracking 8 of partials. Detection 9 of gaps in the partials precedes steps 2-5 for restoring partials by the above-described method 1 ~~of the invention~~. The peaks $P_{i+n}(\hat{A}_{i+n}, \hat{\omega}_{i+n}, \hat{\phi}_{i+n})$ reconstructed by executing the method 1 are then treated as peaks resulting from the harmonic analysis, and additive synthesis 10 of the signal corresponding to the partial restored from these reconstructed peaks may be effected by one of the prior art (third or fifth order) phase interpolation methods, for example.